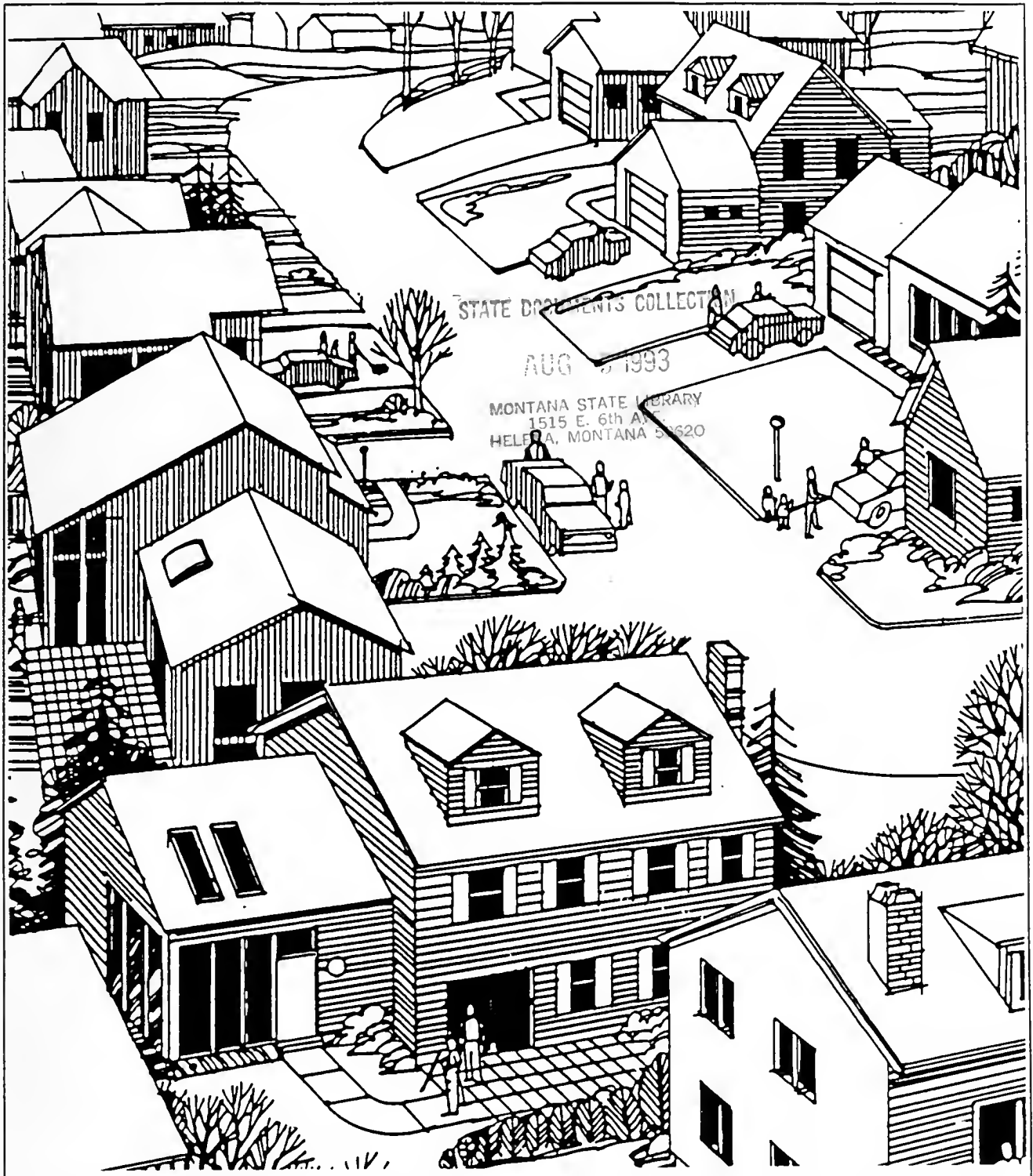


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ISSUE PAPER
CONSERVATION ACQUISITION PROGRAM DESIGN:
LESSONS LEARNED AND IMPLICATIONS
FOR FUTURE PROGRAMS

89-32



NORTHWEST POWER PLANNING COUNCIL
September 20, 1989

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To Interested Parties:

The Council is circulating the attached staff issue paper entitled, "Conservation Acquisition Program Design Lessons Learned and Implications for Future Programs" (publication #89-32).


The Northwest has nearly 10 years' experience running programs that acquire energy efficiency savings as resources for the region's power system. As the Council considers resources for its next Northwest Power Plan, it is reviewing findings from the past decade's activities. The attached paper looks at the lessons learned acquiring conservation and their implications for future programs.

Although the Council does not intend to take any formal action on this paper, it will make use of information obtained from program evaluations and public comment on the issues raised in this paper in the development of the 1990 Power Plan's Action Plan.

The attached issue paper explores what has been learned about the barriers to developing the Northwest's conservation potential. It then discusses two approaches to program design where the Council and the Bonneville Power Administration face significantly different options for overcoming those barriers. Finally the paper discusses the implications of the "lessons learned" for the Council's 1990 Action Plan.

The Council is actively seeking comment on the issues raised in and related to this paper. **Deadline for comment is 5 p.m. Friday, October 13, 1989. Oral testimony will be taken at the Council's October 11-12 meeting in Spokane, Washington.** It would help us record and circulate your comments quickly and accurately if you would mark your comments with either the issue paper title or publication number.

Sincerely,


Dulcy Mahar, Director
Public Involvement

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CONSERVATION ACQUISITION PROGRAM DESIGN LESSONS LEARNED AND IMPLICATIONS FOR FUTURE PROGRAMS

INTRODUCTION

Over the past decade, the Northwest and other areas of the country have implemented, with mixed success, a wide range of conservation programs. In the Northwest, the combined expenditure for conservation by the Bonneville Power Administration and the region's utilities totals over \$1 billion.¹ Some of this covered research and pilot projects, but the majority (\$805 million) went to purchase 348 average megawatts of energy savings at an estimated cost of 1.4 cents per kilowatt-hour.

As the region nears load/resource balance, the timely and efficient acquisition of conservation resources on a significantly increased scale will be necessary. Figure 1 shows the annual expenditures for conservation acquisition that would be needed under the Northwest Power Planning Council's medium-high load growth scenario between 1989 and 1997.² The Council's 1990 20-year Power Plan will recommend actions that Bonneville, the region's utilities and other entities should take to develop these conservation resources. The nature of these recommendations will influence the way conservation resources are acquired. Is the region prepared to expand its acquisition of conservation rapidly and efficiently? The evaluations of past conservation programs provide insights that can both help answer this question and offer guidance for future program design decisions.

This paper addresses three major topics. The first section discusses the principal barriers to the development of conservation. The second discusses two program design areas where the Council and Bonneville face significantly different options for overcoming those barriers. This section also attempts to identify the strengths and weaknesses of each option, based on nearly a decade of experience. The final section discusses the implications of the "lessons learned" for the Council's Action Plan.

- 1./ This includes funds spent both for conservation acquisition and for "capability building." See "Assessment of Regional Progress Toward Conservation Capability Building," Northwest Power Planning Council (March 1989) Document 89-8, for a more extensive treatment of this topic.
- 2./ The estimated expenditures shown in this figure include the total cost to the region to purchase and install all measures. It is likely that acquisition programs can be designed to achieve high penetration rates, with less financial assistance than is shown in Figure 1.

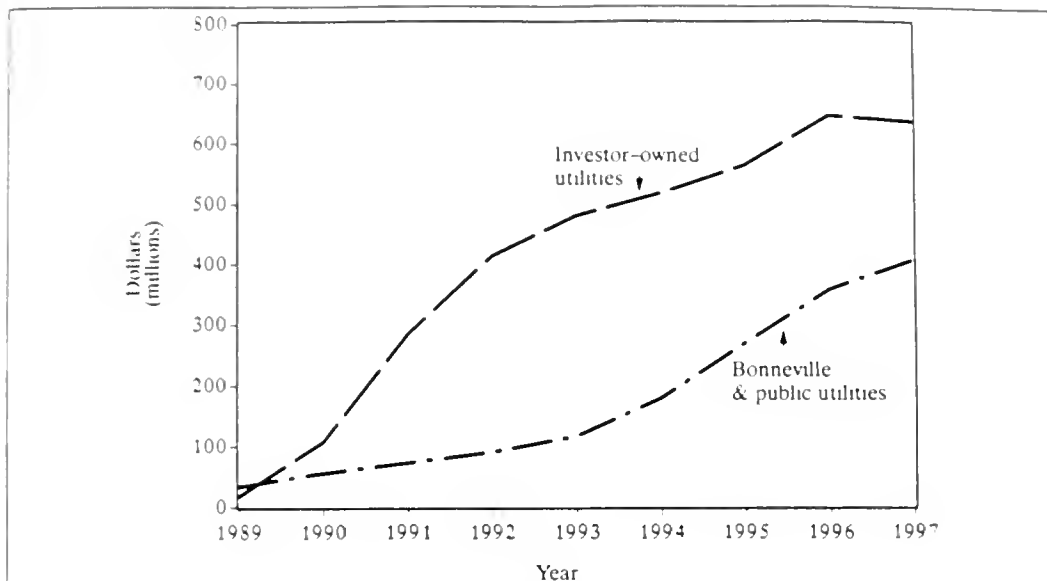


Figure 1
Projected Conservation Expenditures - Medium-high Scenario

The Council is soliciting comment on what the experiences of the past decade imply for future conservation acquisition efforts. Although the Council does not intend to take any formal action on this paper, it will make use of information obtained from program evaluations and public comments on the issues raised in this paper in the development of the 1990 Power Plan's Action Plan. Oral comment on this paper will be taken at the Council's meeting in Spokane, Washington on October 11-12, 1989. Written comment should be received at the Council's Portland office by close of business October 13, 1989.

It is important at the outset to explain how program evaluations have been used in the development of this paper.³ The focus of this paper is on conservation program design. Consequently, it draws primarily upon "process evaluations," evaluations that concentrate on program implementation efficiency and effectiveness.⁴ Process evaluations are carried out during the program operation and, as a consequence, can be used by program managers to modify the program while it is still in progress. Process evaluations frequently rely on interviews of program personnel, program participants and non-participants.

3./ Unless noted otherwise all citations in this paper refer to evaluations prepared for the Assessment and Evaluation Branch of the Bonneville Power Administration's Office of Energy Resources.

4./ In the lexicon of professional evaluators there are two types of evaluations. These are "process evaluations" and "impact evaluations." In contrast to process evaluations, impact evaluations focus on results, for example, the actual cost and savings achieved by a program compared to expected. In the case of pilot programs (which characterize the majority of the programs implemented in this region over the last decade), impact evaluations are normally carried out at the conclusion of the program.

At best, the results of these evaluations represent accurate "snapshots" of the operation of a program at a particular moment in its history. They reflect not only how effective and efficient the personnel operating the program are at achieving the program's goals, but also how well the program's design suits the needs of its ultimate participants, given the circumstances under which the program operates. For example, a particular program design may be highly effective at generating participation during a period of rapidly escalating electric rates. However, during a period of relatively stable rates, this same program design might attract few participants. The conclusions drawn and recommendations made in the reports used to prepare this paper have not, therefore, been viewed as "great truths," but rather as the insights of observers who have the advantage of "20/20 hindsight."

BARRIERS TO CONSERVATION DEVELOPMENT

There are two sets of barriers to securing the conservation resources identified in the Council's current plan. The barriers that have received the most attention in programs operated in the region are those presented by the region's electricity consumers. These fall into three general categories:

- Economic barriers - Inadequate access to capital at competitive terms, inaccurate price (or market) signals; high rate-of-return/payback requirements; low priority investment relative to other uses of limited funds such as product improvement, vacations, and so forth;
- Information barriers - Inadequate information on what to do; inaccurate perceptions, for example, the view that conservation means doing without;
- Institutional barriers - Arrangements that separate the benefits (i.e. motivation) from the costs (i.e., responsibility) such as tenant/landlord relationships; political resistance to regulatory changes (e.g., codes, appliance standards).

A second set of barriers to acquiring conservation are those faced by the region's electric utilities and Bonneville. These can also be classified into the same three general categories faced by the region's consumers. However, the specifics differ. The economic barriers to acquiring conservation for the region's utilities and Bonneville stem from a concern over the rate impacts of expenditures for acquisitions and "lost revenues."⁵ The uncertainty over the regulatory treatment that investor-owned utilities' investments in conservation will receive also serves as a barrier.⁶ Utility enthusiasm for conservation is also restrained by a lack of information on conservation's long-term cost-effectiveness, its reliability as a resource

5./ It is worth noting that in order to overcome the consumer's economic barriers, an economic barrier to the utilities' and Bonneville's acquisition of conservation may be created. For further treatment of the rate impacts of conservation expenditures see "The Role of Conservation in Least-Cost Planning" Northwest Power Planning Council (1988). Document No. 88-17.

6./ For an expanded treatment of this issue see "Regulatory Barriers to Conservation," Northwest Power Planning Council (March, 1989). Document No. 89-10.

and its potential impacts on electricity's market share. The institutional barriers faced by the region's utilities and Bonneville include:

- Staff limitations (both in number and in technical capability);
- The perspective that conservation is a customer service rather than a resource;
- The insistence of many utilities that they always be "in-the-loop" when conservation is acquired in their service territory;
- The view that conservation acquisition payments are "subsidizing" one group of consumers at the expense of another.

The program evaluations conducted over the past decade focus on how effective Bonneville and the region's utilities have been at overcoming the barriers to the end-use consumer's adoption of conservation. These evaluations do not address the barriers faced by Bonneville and the utilities. The Council is particularly interested in receiving comment on what might be done to overcome these barriers.

PROGRAM DESIGN ISSUES

ISSUE 1 - Implementation Roles and Responsibilities

Definition of the Issue

The institutional environment in the region remains unsettled with respect to the future development of conservation and other electrical energy resources. Bonneville's resource acquisition strategy and its relationship to utilities, governmental bodies and other entities in the region has yet to be fully defined. The Council's 1990 Power Plan must, of necessity, offer its opinion as to the appropriate role and responsibilities of implementing entities throughout the region. The Council's current views, for example, on how conservation in new buildings should be developed are clearly set forth in its model conservation standards for new residential and commercial buildings and utility conservation programs. These standards call for a shared responsibility for the development of the conservation savings between state and local governments and the region's utilities.

The Council's recommendations for acquisition of all resources must either explicitly or implicitly assume a set of institutional roles and responsibilities. Among the most important questions to be addressed in resolving this issue are:

- Which conservation resources should be designed for decentralized development? Which for centralized acquisition?
- When should Bonneville act as a "wholesaler" (as opposed to a "retailer") of conservation resource development programs?
- What role should retail electric utilities play in conservation resource development?
- What role should the private sector play in conservation resource development?

- What role should state and local governments play in conservation resource development?
- What role should non-electric utilities play in conservation resource development?

Options for Resolution

The answers to these questions depend to a large degree on the role played by Bonneville. The following discussion of alternatives is structured according to two scenarios, each defining markedly different roles for Bonneville.

Option 1 - Bonneville assumes the role of a "conservation retailer"

Over the past decade, Bonneville has adopted the role of a conservation retailer, serving as the region's primary source of conservation programs. With Bonneville acting in this role, conservation has been acquired through centralized program planning and decentralized program implementation. The majority of electricity conservation programs operated in the region over the last decade were developed by Bonneville for implementation by the region's utilities, governmental bodies and other entities. When a utility (or other local entity) was unable to implement a Bonneville program, Bonneville's area offices occasionally took on some of the implementation responsibilities.

Bonneville's Residential Weatherization Program, Super GOOD CENTS Program, Irrigated Agriculture Program, Code Adoption Demonstration Program, Commercial Audit Program, Commercial Incentive Pilot Program, Energy Edge and Smart Design Programs are just a few of the programs developed by Bonneville and implemented by other entities.

Placing Bonneville in the conservation retailer role has had several advantages. First, because this is a role Bonneville has adopted since the passage of the Northwest Power Act, the agency is better prepared to carry out the required activities than are other entities in the region. Bonneville has a conservation program planning staff. It has, and continues to develop, programs for regional implementation. The region's utilities, albeit some very reluctantly, have generally followed Bonneville's lead with respect to conservation programs. If Bonneville were to adopt a different role, one that required other entities to develop their own conservation acquisition programs, it is possible that additional time would be needed for the utilities and others to create such capability.

A second virtue of charging Bonneville with the conservation retailer role is that conservation programs are likely to be more consistent across the region and with the Council's plan. For example, utilities operating Bonneville's Residential Weatherization Program follow a single set of specifications. This is also true for utilities operating the Super GOOD CENTS Program. This simplifies life for manufacturers, suppliers, designers and contractors. Bonneville's programs also tend to embody the policies set forth in the Council's plan. For instance, in its 1983 Power Plan, the Council stated that Bonneville should revise its weatherization program so that homes occupied by low-income families and renters would be served in proportion to their presence in a utility's total residential customer population. Based on the evaluation of Bonneville's Low-Income Weatherization Program, it is unlikely that this would have occurred without the agency's program

requirements.⁷ In another case, as a result of a Bonneville program requirement (established pursuant to the Council's plan) that "all structurally feasible and regionally cost-effective" conservation measures be installed, more measures and larger savings were achieved in the buildings participating in Bonneville's programs compared to a program operated by a utility that did not have the same requirement.⁸

The principal disadvantage of continuing to assume that Bonneville should play the conservation retailer role is that its record to date has received mixed reviews. Many utilities, particularly the large public utilities and the region's investor-owned utilities, have strongly resisted Bonneville's centralized program planning approach. These utilities argue that they have the capability to develop their own programs. In contrast, the region's smaller utilities frequently find Bonneville's programs beyond their ability to implement, given current staffing levels. These small utilities are reluctant to add more staff, because they fear (based on their prior experiences) that they may have to dismiss staff if Bonneville should decide to significantly reduce or terminate a program.⁹ Bonneville's ability to work with state and local governments and the private sector, while improving, is still immature.

Bonneville's reputation has suffered for a variety of reasons, some of which were beyond the agency's control. Due to a regional surplus, the Council called for Bonneville to significantly reduce its acquisition of discretionary resources. In response to lower than anticipated revenues due to reduced out-of-region sales, Bonneville also cut back its efforts to develop the capability to acquire lost-opportunity resources, a move that was not consistent with the Council's plan. Several Bonneville programs, including the Residential Weatherization Program and Energy Edge, were scaled back and others, such as the Purchase of Energy Savings Program, were prematurely terminated. These actions led to Bonneville's being viewed by some as an unreliable business partner. Also, following the significant Bonneville rate increases in the early 1980s, utility concerns about the effect of Bonneville conservation programs on their rates and revenues persist. These utilities have exerted significant pressure on the agency to trim its conservation development efforts. This concern has also made some utilities reluctant to support or participate actively in Bonneville programs.¹⁰

7./ "BPA Low Income Weatherization Process Evaluation" Final Report (August 1986).

8./ "Comparative Analysis of Commercial Sector Financing Mechanisms: CIPP, PES Pilot and Puget Incentive Programs" (September, 1988).

9./ "Process Evaluation of the Bonneville Power Administration Interim Residential Weatherization Program," (June, 1984) and "Process Evaluation of the Bonneville Power Administration Long-Term Residential Conservation Program," (November, 1984).

10./ See for example the "Process Evaluation of Bonneville Power Administration's Irrigated Agriculture Conservation Program," (October 1986).

Option 2 - Bonneville assumes the role of a "conservation wholesaler"

This option would establish Bonneville's role in the region as a major purchaser of conservation savings. Its primary responsibility would be to attract as many investments in conservation as are cost-effective and needed to meet demand. In keeping with this role, the Council's plan would not charge Bonneville with developing new conservation programs. Instead, other entities (retail utilities, local governments, private sector ventures) would be responsible for telling Bonneville what programs they would offer so that they could develop the region's conservation resources. Bonneville would establish a variety of mechanisms for purchasing the savings, including competitive bidding, targeted solicitations and billing credits.¹¹

Bonneville has gained limited experience as a conservation wholesaler through its Aluminum Smelter Conservation Modernization Program and Sponsor-Designed Programs.

In contrast to the other programs implemented by Bonneville, the Conservation Modernization Program: 1) did not specify the measures to be installed, and 2) focused on facilities where the consumption of electricity per unit output could easily be monitored. This made it a good candidate for centralized acquisition with minimal staffing requirements for oversight.

In the Sponsor-Designed Programs, Bonneville solicited energy conservation savings from a wide spectrum of potential "retailers." These included utilities, industrial firms, architect/engineering firms, local and state governments and other entities. In contrast to other Bonneville programs, under the Sponsor-Designed Programs, respondents were asked to propose how they would develop a conservation resource, rather than being told how to acquire the savings.¹²

If the actions included in the Council's 1990 Power Plan for implementation by Bonneville were to build upon the experience gained from the Conservation Modernization Program and Sponsor-Designed Programs (i.e., place Bonneville in the role of a conservation wholesaler) they would be materially different than if Bonneville were to continue to function as a conservation retailer. For example, rather than continuing to acquire conservation savings in new manufactured housing through the utilities operating Super GOOD CENTS, Bonneville might be requested to negotiate contracts with the manufacturer's who sell manufactured homes in this region. These contracts could provide an acquisition payment for each unit produced that satisfies the Council's model conservation standards for new residential buildings. Along similar lines, instead of trying to effect conservation improvements in buildings built by or for major chains and franchises in the region through individual utility marketing efforts, Bonneville might be asked to negotiate,

11./ For a discussion of competitive bidding as a means of resource acquisition see "Bidding for Resources," Northwest Power Planning Council (March, 1989) Document No.89-9.

12./ "Process Evaluation of the Sponsor-Designed Site Specific Program," (March 1987).

either directly or using a third party, contracts to acquire the savings available in both new and existing buildings under their ownership or control.¹³

The principal advantages of placing Bonneville in the role of a conservation wholesaler, are that 1) it offers the potential for more program design innovation, 2) it allows the agency to select the best bid from a variety of potential "retailers," rather than always relying on individual utilities, 3) it could increase the flexibility of discretionary resources if acquisitions are carried out by private sector, rather than by public sector contractors.¹⁴ 4) it could reduce the conflicts between the treatment of conservation as a resource and its use as a customer service, and 5) it appeals to free-market initiative. Rather than dependence on a large conservation planning and program implementation staff, Bonneville would place greater reliance on private sector initiatives and contractors for both the design and delivery of the programs.¹⁵ Thus, placing Bonneville in the conservation wholesaler role would most likely result in less public sector institutional expansion than if Bonneville were directed to adopt the conservation retailer role.

On the other hand, the conservation wholesaler option is not without its problems. It will require substantial revision in Bonneville's and the region's utilities' institutional direction and behavior. In particular, some wholesale acquisition strategies will not be possible without the cooperation of Bonneville, its customers and the region's investor-owned utilities.¹⁶ Moreover, there is little record on which to judge Bonneville's ability to operate as a wholesaler. Other than the residential weatherization program, Bonneville has not operated regionwide acquisition programs on a scale that might be called for in order to maintain load/resource balance should the region continue to experience rapid economic growth.

Two other potential problems also may be associated with placing Bonneville in the role of a conservation wholesaler. One is that because this approach places substantial dependence on private sector initiatives, some market segments may remain untapped due to their low profitability. The other concern is that in

13./ "Marketing to Centralized Decisionmakers - Final Report" (March, 1987).

14./ This assumes that private sector contractors are able to adjust staffing levels more quickly than public agencies.

15./ Bonneville is presently testing this concept through its Sponsor Designed Program. See "Process Evaluation of the Sponsor-Designed Program: The Refrigeration Retrofit Program for the Food Processing Industry." (February, 1988. See also "Evaluation of the Commercial Incentive Pilot Program - Draft Process Evaluation Report," (July, 1989) for a discussion of the potential implications of program expansion on Bonneville personnel needs.

16./ For example, very efficient domestic water heaters are not widely available in the region. Bonneville and the region's utilities, by establishing a uniform efficiency standard for their programs and/or through a collective purchase order, might be able to move the market. Water heater sales in Bonneville's service territory alone may not be large enough to alter the distribution of efficient models.

operating as a conservation wholesaler Bonneville may have less ability to minimize "cream-skimming" and ensure proper quality control.

ISSUE 2 - Striking a Balance Between Information, Financial Assistance/Incentive and Regulatory Strategies

Definition of the Issue

Regardless of the role adopted by Bonneville and the level of detail contained in the Council's 1990 Power Plan, some mechanism for encouraging the development of conservation must be used. These mechanisms may be classified into three strategies:

- Education (e.g., workshops, appliance labeling);
- Financial assistance/incentives (e.g., no-interest or low-interest loans, acquisition payments, rate design); and,
- Regulatory standards (e.g., building codes, appliance efficiency standards, utility service requirements).

Each of these strategies has unique attributes with respect to cost, political acceptability, fairness, predictability, flexibility and reliability. The issue confronting the Council and Bonneville is which mix of strategies is best suited to developing the conservation potential in each market segment.

Based on the past 10 years' experience in the region, there does not appear to be a single obvious "best mix" of strategies. Instead, the mix likely will vary significantly among market segments and even within the same segment over time. Therefore, in the discussion that follows, strategies have been combined in ways that have been found to successfully overcome each of five principal barriers to conservation implementation:

- Inadequate access to capital at competitive terms;
- Inaccurate price (or market) signals;
- Institutional arrangements that separate benefits (i.e., motivation) from costs (i.e., responsibility);
- High rate-of-return/short payback period requirements; and,
- Inadequate or inaccurate information.

Each combination emphasizes a different strategy. Each was also designed under the assumption that the barrier in question is the limiting factor inhibiting conservation.

Discussion of Strategies

Barrier 1 - Inadequate access to capital at competitive terms

Access to the capital needed to implement conservation measures has been identified as a major barrier in conservation programs implemented in every sector. Program evaluations have shown that even with financial assistance to cover a substantial portion of the cost of measures with rapid paybacks, some individuals, businesses, farmers and industries, could not secure the necessary matching funds to implement the measures.¹⁷

This barrier appears to be most easily overcome with program design strategies that provide up-front capital, such as payments which cover all or most of the cost of the conservation measures or that provide no-interest or low-interest loans. For example, in the Hood River Conservation Project, where participants were offered full-cost coverage to install the recommended conservation measures, nearly all eligible consumers participated.¹⁸

The use of financial assistance strategies in the form of no-interest or low-interest loans is not as attractive as cost-sharing for some potential participants, despite the fact that it overcomes capital-access problems. For example, when offered the opportunity to choose either a zero-interest loan or an up-front payment that covers approximately 70 percent of the cost of the conservation measures, the vast majority (approximately 95 percent) of commercial customers in Puget Power's program selected the up-front payment.¹⁹ The administrative cost of loan programs compared to programs that provide acquisition payments also tends to be higher. Consequently, programs that provide acquisition payments appear to be both more effective in attracting participants and less costly to run than programs designed around loans or other mechanisms, which are set up to recover all or a portion of the conservation measure's cost from participants.

Successful financial assistance programs depend on consumers' awareness and their desire and/or ability to act. As a result, the use of financial assistance payments must be accompanied by information and education strategies.

17./ See for example, the "Process Evaluation of the Bonneville Power Administration's Long-Term Residential Conservation Program," (November, 1984), "Process Evaluation of the Sponsor-Designed Site Specific Program," (March, 1987), "Non-Response Evaluation Site Specific Sponsor-Designed Program Focus Group - Summary Report," (September, 1986), "Small Business Weatherization Program Process Evaluation," (July, 1987), "Commercial Incentive Pilot Program - Draft Process Evaluation," (July 1989); and, "Process Evaluation of the Bonneville Power Administration's Irrigated Agriculture Conservation Program," (October, 1986).

18./ "Cooperation and Community Conservation: The Hood River Conservation Project Comprehensive Report," (July, 1987) and "Potential vs Practice: Installation of Retrofit Measures in the Hood River Conservation Project," (September, 1985).

19./ "Comparative Analysis of Commercial Sector Financing Mechanisms: CIPP, PES Pilot and Puget Incentive Programs," (September, 1988).

Furthermore, unless payments are associated with the achievement of a minimum standard, there is no assurance that all regionally cost-effective conservation savings will materialize.²⁰

Barrier 2 - Inaccurate price (or market) signals

Although the cost of electricity has increased in the Northwest, it still represents a small fraction of the total expenditures for most individuals and businesses. As a result, there is little motivation either to invest in conservation measures or to carry out operation and maintenance activities to keep equipment running efficiently.

Incentive strategies in the form of rate designs could overcome this barrier. These strategies appear to be effective in both motivating capital investments and in ensuring efficient operation of equipment, once it is in place. In other areas of the country, time-of-day rates coupled with high demand charges have been used successfully to induce businesses and industries to install "peak-shaving" devices such as thermal storage equipment. In this region, many utilities use inverted-block rate designs, which charge more for each kilowatt-hour as use increases. Some also charge more in the winter than in the summer. Both of these rate designs send consumers the correct market signal. At the wholesale level, Bonneville could also use rate designs to encourage utilities or local governments to implement conservation programs.²¹

The use of rates to provide more accurate price signals has not traditionally received enthusiastic response from consumers or even some utilities. Consumer resistance to such strategies as inverted rates can, to some extent, be attributed to their perceived inability to make capital investments in conservation to offset the higher rates. Thus, the provision of acquisition payments in combination with inverted rates would appear to be highly desirable. The accurate price signal would serve to motivate consumer response. The availability of capital at competitive terms (including at no cost) would then permit consumers to respond expeditiously to the signal. As evidence of this relationship, utilities that participated in both Bonneville's interim and long-term weatherization programs indicated that the number of audit requests dropped as rates began to stabilize and the portion of the customers' cost sharing increased.²²

20./ "Identification of Factors Affecting Conservation Investment Decisions by Owner-Occupied, Single-Family Homes - Research Review," Prepared for Seattle City Light, Conservation and Solar Division, by Sextant Consultants, Inc. and O'Neill and Company (June 1986). See also Olsen, Marvin, and Bernward Joerges. The Process of Promoting Consumer Energy Conservation: An International Perspective. (Berlin: International Institute for Environment and Society, 1981.)

21./ Although under the Northwest Power Act, Bonneville could use "billing credits" [Section 6(h)(1)] to reward conservation oriented retail rate designs or other utility conservation actions, the Act effectively limits such credits to the difference between Bonneville's rate and the cost of the conservation investment (that is, it seems to impose the "no-losers test" at the wholesale level).

22./ "Process Evaluation of the Bonneville Power Administration Long-Term Residential Conservation Program," (November, 1984).

Barrier 3 - Institutional arrangements that separate benefits from costs

This barrier is perhaps best characterized by the tenant/landlord and builder/home buyer relationships. Tenants who pay their own energy bills have the motivation to make conservation investments, yet it is the landlord's responsibility to make the investments. Similarly, builders do not pay the utility bills of the houses they build, yet they typically select the energy efficiency of the home. Of all the barriers to the implementation of conservation, this one is the most vexing. The most logical strategy for overcoming this barrier is to restructure the institutional arrangements. For example, the imposition of new building codes effectively makes the builder responsible for ensuring that the building is an efficient structure. The occupant pays the added cost of increased efficiency, which rewards the builder for meeting the code. The occupant is then rewarded for purchasing an energy-efficient residence by lower life-cycle costs. The Act provides the Council authority to recommend "model standards." This mechanism appears to offer one tool for such institutional remodeling.

Another approach to overcoming perverse institutional arrangements has been to employ financial payments. For example, apartment owners have been offered financial assistance for retrofitting their buildings under Bonneville's residential weatherization program. Commercial building owners that lease space have been offered financial assistance through several Bonneville and utility programs to install conservation measures for their tenants. Builders of multifamily developments are also eligible for Super GOOD CENTS payments.

Restructuring institutional arrangements by means of regulatory standards (i.e., model standards) typically meets political resistance. However, if combined with financial payments, which serve to offset the cost of meeting the standard, such resistance can be reduced. Bonneville's model conservation standard code adoption program (i.e., the Northwest Energy Code) operates under this design. However, the purpose of providing financial assistance in the Northwest Energy Code program is not to reduce political resistance. Without the payment, the financial burden of meeting the standard is borne entirely by the consumer. Thus, absent the payment, the cost of developing the conservation available in new residential buildings is paid for by the home buyer, rather than the region's ratepayers, as would be the case if a new generating resource were being purchased. The Council has determined that consumers should only be required to invest in conservation measures that minimize their life-cycle costs. Measures that are cost-effective for the region's power system, but beyond those that minimize a consumer's life-cycle cost, should be paid for by the power system.

Barrier 4 - High rate-of-return/short payback period requirements

This barrier relates to the "opportunity cost" of conservation. In essence, the problem is that consumers as individuals and as business managers tend to have higher discount rates and shorter time horizons than does society in general, and the electric utility system in particular. Thus, they demand a higher rate of return or shorter payback period for their investments than does the utility system. Industrial customers, some of whom participated in Bonneville's Sponsor-Designed Program and some of whom did not, indicated that the three-year payback criteria used in that program was too long.²³ Commercial business owners participating

23./ "Non-Response Evaluation Site Specific Sponsor Designed Program Focus Group - Summary Report," (September, 1986) and "Process Evaluation of the Sponsor-Designed Site Specific Program," (March, 1987).

in two other Bonneville programs stated that they probably would not have undertaken the conservation actions had not Bonneville's financial assistance reduced the payback period to three years or less.²⁴

The principal strategy used to overcome this barrier has been to provide financial assistance or acquisition payments. Acquisition payments reduce or eliminate a conservation investment's initial cost or the cost of interest associated with money borrowed to pay for the conservation. Such payments have been shown to be an effective tool for motivating conservation investments in all sectors.

Rate designs can also be used to improve the economics of any investment. The primary advantage of providing an incentive through rates, is that the incentive is ubiquitous. When combined with a financial payment program targeted at conservation measures that are regionally cost-effective, but not economical in the consumer's view, conservation rates could prove highly successful. However, the viability of such a strategy has not been tested in the Northwest.

Barrier 5 - Lack of information or the presence of inaccurate information

Lack of information or the presence of inaccurate information regarding the conservation potential, its cost-effectiveness, risks, reliability and other factors can be a significant barrier to conservation development. Bonneville, the region's utilities, state energy agencies and local governments have operated a variety of programs designed to provide information and technical assistance on conservation to consumers.²⁵ These have included such things as builder/contractor training, energy education, workshops for designers, and training for building code officials, lenders and appraisers. These programs were designed primarily to inform consumers and train individuals who provide conservation services.

Bonneville has also tested several programs to determine the effect that providing information only will have on consumer adoption of conservation. In its Commercial Audit Program, Bonneville paid for approximately 3,800 audits. Six months following the audits, less than 10 percent of the recommended measures had been implemented. Of the measures implemented, nearly one-quarter were the replacement of 40-watt fluorescent light bulbs with 34-watt bulbs.²⁶ Similar response to information-only programs was observed in the 25 industrial plants audited in Bonneville's Industrial Test Program. Ten to 15 months after being provided the information from these audits, very few of the measures recommended had been or were planned to be installed. Those that were all had paybacks of three years or less.²⁷ Therefore, it appears that additional or more accurate

24./ "Process Evaluation of the BPA Purchase of Energy Savings Pilot Program," (October, 1987) and "Process Evaluation of the Commercial Incentive Pilot Program - Draft," (July, 1989).

25./ The Act authorizes both Bonneville [6(a)(1)(B)] and the Council [4(g)(3)] to provide technical assistance and information to promote conservation.

26./ "Evaluation of the Commercial Audit Program - Interim Report # 1," (December, 1987).

27./ "Process Evaluation of the Industrial Test Program - Final Report," (February, 1987).

information can induce some consumers to invest in conservation. Consequently, information is clearly a critical element for prompting consumer actions. However, what is also clear is that information alone does not result in a high penetration rate of measures that are cost-effective for the region, but beyond the payback criterion established by most businesses and industries.

IMPLICATIONS FOR FUTURE PROGRAM DESIGN

Implementation Roles and Responsibilities

Based on the experiences of the past decade, it appears likely that Bonneville will continue to serve as both a conservation "wholesaler" and a conservation "retailer." However, if it is to maintain its conservation retailer role, there are several areas Bonneville must address to improve the region's ability to acquire additional conservation efficiently and in a timely manner. These areas include:

- Streamlining a frequently protracted procurement process (it typically takes six months to process a request);
- Reducing the length of time it takes to establish and/or modify contracts (it was two years after the release of the procurement request for the Commercial Incentive Pilot Program before the first conservation measure was installed);
- Paying closer attention to the internal personnel requirements, including management continuity, needed to operate programs over their expected life. (Energy Edge has had five project managers in five years).²⁸
- Implementing major programs only after their goals and objectives and evaluation plans are adopted; and²⁹
- Clarifying, particularly for its utility customers, the intent and expected duration of programs before implementation begins, e.g., differentiate conservation acquisition programs from customer service programs, limited duration pilots or demonstration programs from long-term acquisition programs, and so forth.

Even if these barriers to Bonneville's acting as a retailer can be remedied, the region would be better prepared to acquire conservation if Bonneville were to enhance its capability to acquire resources on a "wholesale" basis. The first step in this process should be the development and implementation of a work plan to identify the conservation resources that can most effectively be acquired in this manner. The next step would be to develop the capability necessary to procure such resources (e.g., solicit bids from potential "retailers," negotiate options for implementation, and so forth). During this process, Bonneville will need to resolve the role utilities, local and state governments and other entities are to play in the agency's wholesale conservation acquisition programs.³⁰

28./ "Energy Edge Process Evaluation." (December, 1988).

29./ Ibid.

30./ For example, the role of a utility servicing an industrial customer that participates in a conservation transaction with Bonneville will need to be addressed.

Balance Between Information, Financial Assistance/Incentive and Regulatory Strategies

The regional Act provides a limited set of explicit criteria for selecting conservation programs. They must be cost-effective to the region and forecast to be "similarly reliable and available" as an alternative resource. In addition, the Act requires that model standards recommended by the Council be "economically feasible for consumers."³¹ These broad criteria do not provide sufficient guidance for successful program design.

As stated initially, no one mix of program strategies is inherently best. However, based on nearly a decade of program operating experience, the following design tenets appear to be defensible:

- Rate incentive strategies are generally more effective at ensuring efficient operation of existing equipment than they are at motivating capital investments in conservation;
- Financial assistance strategies are generally necessary to secure a high penetration rate of appliances, buildings and equipment that reflect regionally cost-effective levels of efficiency;
- Strategies that rely on regulatory standards are generally most applicable to situations where barriers prevent rational economic choices (e.g. landlord must pay the cost of weatherization, while tenants receive the benefits of lower utility bills); and,
- Informational strategies are generally most effective when used in combination with targeted financial assistance programs.

Also based on the past 10 years of experience, some program features appear to consistently produce conservation savings. Listed below are some criteria that should be used to guide future program design. Effective conservation acquisition programs should attempt to meet the following design criteria:

1. Maximize the use of the free-market system;
2. Offer financial assistance or other incentives rather than invoke penalties;
3. Provide clear and consistent signals to all actors in the decision chain;
4. Rely on the creative use of existing institutions rather than the creation of new institutions;
5. Rely on "intrinsic responsibility" for motivation (i.e., benefits accrue to those who act, costs accrue to those who do not act);
6. Require minimum administrative oversight;

31./ See Sections 3(4) and 4(f)(1) of the Northwest Electric Power Planning and Conservation Act, PL96-501.

7. Offer limited potential for "boomerang effects" (e.g. in response to the provision of solar tax credits, many vendors simply raised their price, rather than increased their sales);
8. Be simple, not simplistic;
9. Be flexible, not ambiguous; and
10. Treat conservation as a resource that can be acquired in a manner comparable to other resources.

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